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Compost-Amended Topsoil

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INTRODUCTION

When topsoils are being prepared for planting in landscape areas, they are often amended with an organic material to create optimum conditions for plant growth. Compost enhances soil texture, increases the ability of the soil to absorb air and water, suppresses weed growth, prevents erosion, and reduces the need for water, fertilizers, and pesticides.

Compost Types

In our region, municipal yard waste and biosolids are used to produce compost.

- Yard Waste Compost is made with decaying organic matter, such as leaves and lawn clippings.
- Biosolids Compost is made by blending sawdust with the nutrient-rich organic material obtained as a by-product of wastewater treatment.

USAGE HISTORY AND EXPERIENCE

Compost-amended topsoil is specified for use in maintenance and construction projects. The Roads Environmental Unit reported that in the past year, their contractors used almost 4,000 cubic yards of topsoil containing yard-waste compost.

BID AND CONTRACT LANGUAGE

King County agencies purchase compost and compost-amended topsoil through term-contracts with local vendors and through subcontractors through large construction contracts. This section includes specifications (shaded areas) from King County and Washington State.

Washington State Department of Transportation

2008 Standard Specifications for Road, Bridge, and Municipal Construction

9-14 EROSION CONTROL AND ROADSIDE PLANTING

9-14.1 Soil

9-14.1(1) Topsoil Type A

Topsoil Type A shall be as specified in the Special Provisions.

9-14.1(2) Topsoil Type B

Topsoil Type B shall be native topsoil taken from within the project limits either from the area where roadway excavation is to be performed or from strippings from

borrow, pit, or quarry sites, or from other designated sources. The general limits of the material to be utilized for topsoil will be indicated in the Plans or in the Special Provisions. The Engineer will make the final determination of the areas where the most suitable material exists within these general limits. The Contractor shall reserve this material for the specified use. Material for Topsoil Type B shall not be taken from a depth greater than 1-foot from the existing ground unless otherwise designated by the Engineer.

In the production of Topsoil Type B, all vegetative matter, less than 4-feet in height, shall become a part of the topsoil. Prior to topsoil removal, the Contractor shall reduce the native vegetation to a height not exceeding 1-foot. Noxious weeds, as designated by authorized State and County officials, shall not be incorporated in the topsoil, and shall be removed and disposed of as designated elsewhere or as approved by the Engineer.

9-14.1(3) Topsoil Type C

Topsoil Type C shall be native topsoil meeting the requirements of Topsoil Type B but obtained from a source provided by the Contractor outside of the Contracting Agency owned right of way.

9-14.4(8)Compost

Compost products shall be the result of the biological degradation and transformation of plant-derived materials under controlled conditions designed to promote aerobic decomposition. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation. Compost shall be mature with regard to its suitability for serving as a soil amendment or an erosion control BMP as defined below. The compost shall have a moisture content that has no visible free water or dust produced when handling the material.

Compost production quality shall comply with Chapter 173-350 WAC.

Compost products shall meet the following physical criteria:

1. Compost material shall be tested in accordance with the U.S. Composting Council, Testing Methods for the Examination of Compost and Composting (TMECC) Test Method 02-02-B, "Sample Sieving for Aggregate Size Classification."

Fine Compost shall meet the following:

	Min.	Max.
Percent passing 2”	100%	
Percent passing 1”	99%	100%
Percent passing 5/8”	90%	100%
Percent passing ¼”	75%	100%
Maximum particle length of 6 inches		

Coarse Compost shall meet the following:

	Min.	Max.
Percent passing 3”	100%	
Percent passing 1”	90%	100%
Percent passing ¾”	70%	100%
Percent passing ¼”	40%	60%
Maximum particle length of 6 inches		

2. The pH shall be between 6.0 and 8.5 when tested in accordance with TMECC 04.11-A, “1:5 Slurry pH”.

3. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0 percent by weight as determined by TMECC 03.08-A “Percent Dry Weight Basis”.
4. Minimum organic matter shall be 40 percent dry weight basis as determined by TMECC 05.07A, “Loss-On-Ignition Organic Matter Method”.
5. Soluble salt contents shall be less than 4.0mmhos/cm tested in accordance with

   TMECC 04.10-A, “1:5 Slurry Method, Mass Basis”.
6. Maturity shall be greater than 80% in accordance with TMECC 05.05A, “Germination and Vigor”.
7. Stability shall be 7 or below in accordance with TMECC 05.08-B, Carbon Dioxide Evolution Rate”.
8. The compost product must originate a minimum of 65 percent by volume from recycled plant waste as defined in WAC 173-350 as “Type 1 Feedstocks.” A maximum of 35 percent by volume of other approved organic waste and/or biosolids may be substituted for recycled plant waste. The supplier shall provide written verification of feedstock sources.
9. Samples may be tested using the Solvita Compost Maturity Test by the Contracting Agency at the Engineer’s discretion. Fine Compost shall score a number 6 or above on the Solvita Compost Maturity Test. Coarse Compost shall score a 5 or above on the Solvita Compost Maturity Test.

The compost supplier will test all compost products within 90 calendar days prior to initial application. Samples will be taken using the Seal of Testing Assurance (STA) sample collection protocol. (The sample collection protocol can be obtained from the U.S. Composting Council, 4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741 Phone: 631-737-4931, www.compostingcouncil.org). The sample shall be sent to an independent STA Program approved lab. The compost supplier will pay for the test. A copy of the approved independent STA Program laboratory test report shall be submitted to the Contracting Agency prior to initial application of the compost. Seven days prior to application, the Contractor shall submit a sample of each type of compost to be used on the project to the Engineer.

Compost not conforming to the above requirements or taken from a source other than those tested and accepted shall be immediately removed from the project and replaced at no cost to the Contracting Agency.

The Contractor shall either select a compost supplier from the Qualified Products List, or submit the following information to the Engineer for approval:

1. A Request for Approval of Material Source.
2. A copy of the Solid Waste Handling Permit issued to the supplier by the Jurisdictional Health Department as per WAC 173-350 (Minimum Functional Standards for Solid Waste Handling).
3. The supplier shall verify in writing, and provide lab analyses that the material complies with the processes, testing, and standards specified in WAC 173-350 and these Specifications. An independent STA Program certified laboratory shall perform the analysis.
4. A list of the feedstock by percentage present in the final compost product.
5. A copy of the producer’s Seal of Testing Assurance certification as issued by the U.S. Composting Council.

Acceptance will be based upon a satisfactory Test Report from an independent STA program certified laboratory and the sample(s) submitted to the Engineer.

King County Contracts

Roads Maintenance

Roads Operations uses compost for maintenance projects. Here are the specifications (shaded areas) they use.

Compost

Standard Specifications: 9-14.4(8)

1. Compost shall contain no plastic, concrete, glass, tree or shrub branches, fresh or partially decomposed wood by-products or similar material. Compost containing yard waste or biosolids shall be produced at a facility possessing a valid Solid Waste Composting Permit issued by the jurisdictional Health Department.
2. Bidder shall indicate the source of feedstocks for the compost, such as: yard waste, yard waste and dairy cow manure with bedding, biosolids and yard wastes, etc.

Compost Topsoil

Specifications:

1. Compost Amended Topsoil shall be a commercially manufactured mixture of soil and pure compost which meets the physical and chemical requirements for Type B topsoil in accordance with Standard Specifications 9.14.1(2) except that the total organic matter content shall be 15% to 30%. The compost used in the mixture shall consist of a well-decomposed, humus-like material derived from composting of yard waste, biosolids, or well rotted manure with a minimum of litter (straw, sawdust, or shavings). The organic material shall contain no plastic, concrete, glass, tree or shrub branches, fresh or partially decomposed wood by-products or similar material. Compost containing yard waste or biosolids shall be produced at a facility possessing a valid Solid Waste Composting Permit issued by the jurisdictional Health Department.

Roads Engineering Environmental Unit

Landscaping is a part of many roads projects, and compost is typically used. Here is the compost specification (shaded areas) generally used in their project documents:

Compost

Compost products shall contain composted plant material derived from the aerobic decomposition of recycled plant waste. The composted plant waste shall have a moisture content that has no visible free water or dust produced when handling the material.

Compost shall be stable, mature, decomposed organic solid waste that is the result of the accelerated, aerobic biodegradation and stabilization under controlled conditions. The result is a uniform dark, soil-like appearance.

Compost maturity or stability is the point at which the aerobic biodegradation of the compost has slowed and oxygen consumption and carbon dioxide generation has dropped. Subsequent testing provides consistent results.

Compost production and quality shall comply with the Interim Guidelines for Compost Quality, #94-38 or superseding editions, and amendments, published by the Washington State Department of Ecology.

Compost products shall meet the following physical criteria:

1. Compost material shall be tested in accordance with AASHTO Test Method T87 and T88. 100% of Type 1 Compost shall pass through a 5/8” sieve. 90% of Type 2 Compost shall be larger than 3/8 inch and smaller than 1 inch.
2. The pH range shall be between 5.5 and 8.5 when tested in accordance with WSDOT Test Method 417.
3. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1 percent on a dry weight or volume basis, whichever provides for the least amount of foreign material.
4. Minimum organic matter shall be 30 percent dry weight basis as determined by loss on ignition. (LOI test)

5. Soluble salt contents shall be less than 4.0 mmhos/cm for areas that receive less than 20 inches of precipitation per year and 6.0 mmhos/cm for areas that receive more than 20 inches of precipitation per year.
6. Type 1 Compost shall score a number 6 or above on the Solvita Compost Maturity Test. Type 2 Compost shall score a 5 or above on the Solvita Compost Maturity Test.

All compost products will be tested within 30 calendar days prior to application by the Contracting Agency with samples taken from the material stockpiled by the supplier for project use. Compost not conforming to the above requirements or taken from a source other than those tested shall be immediately removed from the project and replaced at no cost to the Contracting Agency.

Acceptance of composted products shall be based on the following submittals by the Contractor:

1. A Request for Approval of Material Source.
2. A copy of the Solid Waste Handling Permit issued to the supplier by the Jurisdictional Health Department as per WAC 173-304 (Minimum Functional Standards for Solid Waste Handling).
3. Written verification from the supplier that the material complies with the processes, testing, and standards specified in the Interim Guidelines for Compost Quality.
4. Written verification from the supplier that the compost products originate a minimum of 65 percent by volume from recycled plant waste. A maximum of 35 percent by volume of other approved organic waste and/or biosolids may be substituted for recycled plant waste.
5. A copy of the lab analyses described under Testing Parameters in the Guidelines for Compost Quality. The analyses shall be less than three months old.
6. A list of the feedstock by percentage present in the final compost product.

FOR MORE INFORMATION

US Composting Council

Environmental Protection Agency (EPA) - 40 CFR Part 503 Biosolids Rule Class A and B

Washington State Department of Ecology Compost

Compost Facility Standards – WAC 173-350-220 (replaces Interim Guidelines for Compost Quality)

Washington Organic Recycling Council (WORC)

Washington State University Soil Management

King County Solid Waste Division - Composting

Natural Yard Care – City of Seattle/King County

VENDOR INFORMATION

Cedar Grove Compost (yard waste)
Maple Valley, WA
1-877-SOILS-4U (toll free)

Sawdust Supply - Groco (biosolids)
Seattle, WA
206-622-4321 OR 1-888-622-4321